Space Weather Forecast

Issued on Sunday 23 February 2025 at 00:13 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely. Possible glancing CMEs Days 1-2 (23-24 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with occasional Common-class flares, the largest at 22/2107 UTC from a bipolar region that developed in the far northwest.

There are currently eleven sunspot regions on the visible disc. with several new regions developing in the eastern hemisphere and appearing from over the east limb. The most notable regions are at south centre disc, and in the north centre disc. The region in the south continues to show spot development and magnetic complexity. The region in the north developed rapidly at first, although this has stalled recently. However, it retains magnetic complexity in the trailing portion. A fairly new bipolar region in the far northwest has shown some rapid growth, but is now hard to fully assess as it approaches the northwest limb. The other regions on the disc are smaller and simpler at the present time.

No Earth directed coronal mass ejections (CME) have been seen in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds showed background conditions. Wind speeds varied between 280-350 km/s. Interplanetary Magnetic Field was weak with the north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was very slightly elevated above the normal background level at first but has returned to background, remaining well below the S1/Minor radiation storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is forecast, with isolated M-flares considered likely and a slight chance of X-flares.

Solar Wind / Geomagnetic Activity: There have been several CMEs over the last few days, with confidence in this aspect of the forecast very low. There are two main features which may have the potential to affect Earth. Glancing blows are possible around the middle of the day (UTC) on Day 1 (23 Feb) and again on Day 2 (24 Feb). In addition, late Day 2 or Day 3 (24-25 Feb) a slight fast

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wind enhancement may occur, however at most wind speeds may become slightly elevated around 400-450 km/s.

Geomagnetic activity is forecast to be mainly Quiet to Unsettled, but activity may increase to give a chance of G1/Minor Storm (Kp5) intervals on Days 1-2 mainly due to the risk of CME influence.

Energetic Particles / Solar Radiation: The count rate of energetic particles is likely to persist at background levels, but with a slight chance of increasing above the S1/Minor radiation storm threshold in response to any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	10	5
Strong	G3	No	5	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	60	60	60	60
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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